



Montana Department of Transportation
PO Box 201001
Helena, MT 59620-1001

Memorandum

Distribution

From: Joel Marshik, P.E., Chief Engineer
Highways and Engineering Division

July 25/03

July 23, 2003

Subject: Aggregate Treatment

Due to the cutbacks used in the dilution of MC-70, the Department is in the process of phasing out the use of this material as a prime agent.


Currently, prime is being used to serve two different functions:

1. To treat a gravel surface for the placement of traffic. This is common for detours with moderate traffic of moderate duration, and when paving operations are delayed over a winter.
2. To treat a gravel surface for paving. This is a constructability issue, providing a bonding layer between the gravel surface and the plant mix surfacing to reduce the potential for shoving and excessive rollout.

On numerous construction projects to date, the MC-70 provided by plan for prime has been eliminated, and a combination of dust palliative and a heavy application of tack have been used successfully in its place.

The dust palliative can serve different purposes depending on the duration of time before the tack and asphalt paving occur. If dust palliative is placed on a gravel surface for use by traffic, it not only acts as a dust suppressant, but the cohesive properties of the material help bind the top layer of gravel together. The latter is dependent on the gradation of the material, and will likely not occur if the gradation is too sandy or coarse with minimal fines. If the dust palliative is applied prior to the paving and is still functioning, its affinity to water can help draw the tack into the gravel.

The application of bituminous material (tack) provides the bonding layer between the gravel and the plant mix surfacing. This is especially important if the dust palliative is still present because it can present a tight surface for the paving. There have been construction projects where the paving experienced excessive rollout. The dust palliative may have contributed to that problem.



By industry definition, prime is the application of a bituminous material to a prepared aggregate roadway prior to placing bituminous surfacing. The Department's different uses for prime have skewed this definition somewhat. There are new emulsified prime materials being introduced to the market. The Construction and Materials Bureaus are researching the use of these materials, and their availability and costs in Montana. Until it is determined that it is practical to switch to a new prime material, the MC-70 will be replaced with dust palliative and tack on all construction projects to serve as an "aggregate treatment". Several benefits are realized by this approach:

- The aggregate treatment is more environmentally friendly.
- The cost of this aggregate treatment is half that of MC-70.
- The tack, even at a higher application rate, tends to set up more quickly than MC-70. This is also true in cooler temperatures, which can increase the temperature window in the cooler climates of Montana's mountainous regions or during fall paving operations.
- The dust palliative can help bind the top layers of gravel on detours and gravel sections that carry over the winter. For this to be effective, full gravel sections of specification material must be in place.

The Construction Bureau will be distributing further information on how to detail this in plans.

JM:ld

copies: District Administrators
District Construction Engineers
James Walther, P.E.
Carl Peil, P.E.
Paul Ferry, P.E.
Ron Williams, P.E.
Tom Martin, P.E.
Mark Wissinger, P.E.
Kent Barnes, P.E.